Revealing Myths about People, Energy and Buildings

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ABSTRACT

In this essay we take a closer look at the ways energy professionals and the public alike, talk, write and think about how energy affects the way in which we design, operate, retrofit and inhabit buildings. What are some of the myths about people, energy and buildings that are current today? Who tells these myths and why do we believe them? How do myths affect our behavior? Myths are a way of understanding the world we live in. They may represent incomplete understanding, or be based on premises that are scientifically not valid, but they help us understand and explain how the world works, and we shape our behavior accordingly.

Introduction

Several questions shape the enquiry of this paper: What are the prevalent myths about people, energy and buildings? Who tells these myths and to whom? What can we learn by studying these myths? Why do they arise and persist and what, if anything, should and can be done to address them? While much of this enquiry is empirical, relying on anecdotal and everyday experience, we are also keen to ground our observations in theory, which would allow us to generalize and make stronger claims for our findings. Answering these questions requires attentiveness to the multidisciplinary character of the energy profession (Wilk 1999), a group comprised of people with many different theoretical and ideological perspectives who often talk past each other. Energy professionals summarize, judge, and pass around "knowledge" in a way that can lend itself to myth-making, in part, because of the great differences in motivations and evaluations of truth held by the various actors in the system.

The purpose of this paper is to address three key issues. First, many statements and ideas commonly promoted as true in energy policy and building science have, at best, a weak basis as objectively true. Second, that despite the lack of a good basis in fact, such statements and ideas often guide the actions of both energy professionals and those to whom the information is provided. Third, how can we, as researchers in energy policy and building science, pay more attention to finding the truth by questioning our own statements and assumptions?

Definitions

The term "myth" in popular usage is defined as "any fictitious story or unscientific account, theory, belief, etc." (Webster's *New World Dictionary* 1988). Folklorists reserve the term "myth" to refer to narratives about origins, usually sacred and often metaphorical. For this paper we are generally referring to the popular definition of myth, but we draw on two themes from folklore theory. First, that myths, whether true or not, are a way of structuring

understanding of how the world works, and second, that these myths are shared by a specific group, which could be any collection of people—for example a professional group—who hold and communicate some common beliefs. Thus, our myths are mini-narratives that are reflections of "mental models" (Senge 1990) and "folk models" (Kempton 1986) used to describe how groups and individuals view the world, and in this case, energy use.

Who Tells Myths about Energy and Buildings, and Why?

Myths about energy and buildings appear everywhere, in the professional and practitioner literature, the public press, through movies and television, in business and advertising, and in government and in schools. Wherever people—whether educators, visionaries, political leaders, salesmen, or scientists—talk about energy and buildings, we can find myths. Our focus on myths highlights a particular perspective on how individual and communal knowledge is structured. Communal knowledge is a complex body of ideas and statements, some of which are more true and some of which are less true. This framework leads to the question of how people know what they think they know. For our purposes, what we as individuals think we know is a complicated hybrid of what we are told, what we observe, and our own processing of these sources of information. In distinguishing myths as a type of knowledge, we focus on the relationship between what is claimed and what is true. We recognize that truth, even in the objective realm of science or engineering, is hard to find and tricky to define. We do not pursue nuances of truth and provability here, nor is our goal to definitively knock down energy untruths. Instead we seek to highlight examples where evidence to support a myth is weak or lacking. The distinction between fact and fiction is strongly pertinent to the energy profession because of the political role that energy policy plays as a negotiator between science and politics. This task of negotiation is made all the more difficult because of the "invisibility" of energy and by the strong views people have regarding the environment.

As in most knowledge systems, little of what energy professionals believe as true, and use as truth in their daily work, can be shown to be carefully weighed, carefully articulated statements of irrefutable fact. Rather, such claims and assumptions are combinations of what we believe to be true, what we want to believe, and what we want others to believe. All of these desires and beliefs are situational. They yield to slippages of language and the desire, especially strong in policy-making and marketing, for positive and simple statements that transform specific statements into general ones. Any truth uncovered by science is usually a very particular one, involving conditions, limitations, and uncertainties that may not apply to a general situation. As an example, the finding from a laboratory measurement about the efficiency of a new furnace has many qualifying conditions that are not passed on to the purchaser of the furnace.

Individuals use myths to articulate, legitimize, and support their beliefs, often gaining power and influence by asserting a particular viewpoint. Promoters of energy efficiency, for example, are often faced with defending their beliefs about energy efficiency and with directing others to share their vision and to take action toward it. This may lead them to make claims that portray energy efficiency as easy, effective, good, healthy, or otherwise the right thing to do. Those bent on selling energy efficiency may tell company owners that energy efficiency will increase productivity of building staff, tell those shopping for appliances that energy efficiency will save them money and give them a better product, and tell those reading the utility brochure that they can and should take a few simple energy-

saving steps to do their part for the environment. To support their views, energy-efficiency advocates draw on a traditional set of beliefs as to what is technically effective, and to some extent what is psychologically effective.

Our Collection of Myths

For the past few years we have been collecting myths about energy and buildings, a list that quickly expanded from a few personal favorites to several dozen examples, as friends and colleagues have been eager to share their myths (Diamond 1998). We have chosen to organize this list of myths about people, energy, and buildings into four categories, based on who is telling the myths to whom: 1) Myths told to consumers by utilities, public institutions and non-profits; 2) Myths consumers tell themselves; 3) Myths told by design professionals (architects and engineers) to clients; and 4) Myths told by energy professionals to consumers and each other. By organizing the myths based on which group of people tells them, we can start to look for patterns or motives for why these myths develop and continue. How do these myths influence our policies and efforts to promote energy conservation? Does recognizing that different groups tell different stories help in crafting public policy? Does revealing the truth or lack of truth in these myths further our understanding? Our hope is that by studying these myths we can understand how we construct policy that ultimately affects the way we design and inhabit buildings.

Myths Told to Consumers by Utilities, Public Institutions, Non-Profits

We give two examples here of myths that have appeared in countless guides and brochures provided by utilities, governments and energy conservation advocates. These myths are often in the form of "ten simple things you can do to save the earth/planet/environment" and are typically directed to homeowners and renters. The information from these guides often cannot be traced to any authoritative source, but are commonly borrowed from similar, earlier documents, having gained a relatively unquestioned claim to truth simply by tradition. These tips are usually offered as generalizations, and without quantification. If real savings do result, in most cases they would be too small to be noticed at the consumer level, even if in aggregate—from the utility or national level—they result in observable savings. These recommendations provide positive actions that a homeowner can take immediately, hence their appeal to recommendation-givers. Some might argue that by taking a small positive step in the right direction it will be easier to have the homeowner undertake larger actions, even if the true energy savings from this small step alone is inconsequential. On the other hand, if homeowners do not see results from their actions, they may be less likely to bother with further energy-efficiency recommendations.

Myth #1. Cleaning the refrigerator coils improves refrigerator efficiency. There is some intuitive logic that if you clean the years of accumulated dust from the surfaces of the coils, the heat transfer will improve. Unfortunately, there is little data to support this claim when it comes to refrigerator coils. A review of measured tests with refrigerators showed that there was no or little evidence of improved efficiency from cleaning the coils (Litt, Megowan, and Meier 1993). We put this in the category of things that energy industry professionals like to

recommend, fulfilling their jobs by helping people feel that they have done something good for the environment, and supporting the image of energy efficiency as an easy step in right living. The drawbacks of this recommendation are at least threefold. First, people may try to clean their refrigerator coils and not see the savings in their monthly utility bills, and consequently feel there is nothing more they can or should do. This result could easily happen even if cleaning refrigerator coils did save some energy, since small savings can be difficult to observe. Second, they may be unable to clean the coils—a non-trivial task for many elderly or disabled—and feel guilty that they can't do "their part" for the environment. Third, each recommendation provided to consumers might be considered a cost—one more thing the consumer is being told to do and thus one more step on the road to nagging and disenfranchising the consumer. In that case, it could be all the more important that recommendations are effective, and that they do not encourage consumers to substitute small steps for big ones, or to relinquish responsibility altogether.

Why do we tell this myth? Because it intuitively makes sense (foul coils reduce heat exchange) and because it is a simple thing to do, unlike, for example, insulating a crawlspace. Keeping a clean house is also the sign of a good housekeeper, and we see an association here with energy efficiency and the positive values of homeowner responsibility, indirectly stressing the link between energy efficiency and morality via the idea of cleanliness. Electricity itself is associated with cleanliness, in part courtesy of its cleanliness at point-of-use as compared to that of other fuels; efficiency also connotes cleanliness, as representing the minimal resources necessary to accomplish a job (Hopkins and Moezzi 1997).

Myth #2. Installing foam gaskets in electrical outlets will significantly reduce air infiltration. This recommendation is a simple step for homeowners and is often accompanied by information how it will lower drafts and reduce heating and air conditioning bills. The probable origin for this myth—an unusual case where an origin can actually be identified—was a study in the late 1970s that showed that 20% of the air leakage in fifty homes was due to wall outlets (Caffey 1979). Later studies showed leakage values for outlets to be under 1% (ASHRAE 1997), but the recommendation has been a perennial favorite in the home retrofit literature. Again, there is an intuitive appeal that an outlet is a hole in the wall, and certainly there are instances where one can feel a draft, but the appeal of this myth may be that it is a simple, inexpensive fix, associated with large energy savings. While there may be little harm in making this recommendation (although installing the gasket can actually increase the leakage if the outlet cover was painted to the wall) it may be a poor move for an overall strategy of gaining consumer confidence since it raises expectations of energy savings and improvements in comfort, when neither are likely to occur.

Myths Consumers Tell Themselves

We are interested here in the popular myths—ideas that consumers often share but that are not directly the product of marketing or information programs. One of the classic examples is the common idea of how a thermostat works. Kempton and his colleagues noted that homeowners often use their own mental model of how a thermostat operates, which may be entirely different from an engineering model. In this example, the common myth is that thermostats will make the house heat more quickly if the setting is made higher (Kempton 1986).

Myth #3. Leaving on lights, computers, televisions, printers, copiers, etc., uses less energy than shutting them off and turning them on again. There is a widespread belief that it is better to leave some appliances on then to turn them off, even for short periods of time. There may be good reasons for leaving appliances and lights on, but energy savings is not one of them. Though there are examples when an appliances uses more power in standby than when on, an appliance cannot use less energy when it is left running than when it is off. And yet one hears countless stories that it is better to leave on lights—particularly fluorescent lights—as well as copiers, computers and other appliances.[1] Why do so many people believe this myth? Convenience? Pseudo-science: "there are surges of wasted energy if I turn the switch off and on"? There is, in fact, a small surge in power associated with turning on an incandescent light, but it is minor compared to the energy used when the light is operating. At one time, manufacturers advised against switching fluorescent fixtures on and off frequently because you could reduce tube life by as much as 20 percent. However, the introduction of rapid-start tubes that last for 20,000 hours, twice the lifetime of the old ones, and reduce tube life only 5 to 10 percent (see also Leslie and Conway 1993).

Myth #4. Fluorescent lighting is bad (for your health, bad quality light, noisy, not natural, etc.) and can cause problems with your electrical appliances. There is a large literature on the impacts of fluorescent lighting on human health and performance (Ott 2000). Our intent is not to critique this literature, but to acknowledge that there is a widespread belief in the United States that this particular light source is bad for human health, as well as unaesthetic. These beliefs about the aesthetics and health effects are not global. In Japan, for example, fluorescent lights are often preferred (Wilhite et al. 1996). Where do these ideas that fluorescent lighting is harmful come from and are they myths or do they have basis in fact?

Myths told by design professionals (architects and engineers) to clients.

The myths told by design professionals can come from a number of sources, from traditional rules of thumb that may no longer apply in current building practice, from formal education, and from a misapplication of a specific finding which has become more widespread. Often these myths are not primarily about energy efficiency, rather they address other aspects of design such as windows and fireplaces, but they have important implications for energy efficiency as they often are perceived as justifying practices that discourage energy improvements.

Myth #5. You can't have operable windows in modern commercial buildings. Several arguments uphold this myth, the most common one being that you can't control the HVAC system if you have occupants opening and closing windows. Concerns for security, energy costs, smoke control and the cost of window hardware, are also likely to be important. But some people like operable windows where they live and work. Others may prefer not to have operable windows because of allergies, dust, security or other reasons. There is increased use in northern Europe of "mixed mode" designs, where commercial buildings have both

[1] For example, Cecil Adams, author of *The Straight Dope*, a syndicated newspaper column, considers this question one of his classics: "isn't it true that it takes more electricity to turn the lights on and off frequently than just to leave them on?" *see* (http://www.straightdope.com/).

mechanical and natural ventilation (Arnold 1996). So the myth of not being able to have operable windows in commercial buildings may be due to a lack of willingness on the part of designers to pursue the less common strategies that would allow for both natural and mechanical ventilation. Or it could be due to strict interpretations of building codes that prohibit operable windows. While we cannot settle the debate about operable vs. inoperable windows, again, the assumptions should be spelled out for both sides of this argument.

Myth #6. Rumford fireplaces are energy-efficient. Fireplaces are an on-going source of controversy in the sustainable design arena. Considered one of the most desirable features in new housing, a fireplace is viewed by many as the heart (hearth) of a home. The Rumford fireplace was designed to replace the cavernous fireplaces in early colonial homes. The modern champions of the Rumford fireplace argue that it is inherently efficient, and so it appears in several of the guides to environmentally sensitive design, and is featured in many of the houses designed by prominent green architects. The mythic question here is not which design is more efficient but rather, how do we reconcile the primordial desire for an open flame in our houses with more modern ideas about resource efficiency? For an example of the passions aroused by this issue; see Hayden (1994), and the scorching rebuttal by the Rumford champions (Buckley 1996). Fireplaces are important to many people for many reasons, but they should not be claimed as energy-efficient in any absolute sense.

Myth #7. Energy efficiency increases the first cost of buildings. We frequently hear the belief among design professionals that energy efficiency increases the first cost of the building. New energy-efficient technologies such as high-performance windows can be more expensive than conventional windows and can increase the first cost of a building. But if designers take an integrated approach, they could often recover the increased costs of new technologies by decreasing the costs of others. The improved windows and lighting may allow for significantly lower cooling loads, and the chillers could then be reduced in number and size—at significant lower first cost. The myth of greater first cost needs to be tempered by the cases where integrated design can actually lower the first cost.

Myth #8. If only we had gotten into the design process earlier we could have improved the energy and environmental performance of the design. We hear this from consultants all the time. By the time they are brought to the table, all of the key design elements have been decided and all they can do is make minor changes. So the question is, when is the best time to bring in technical expertise? Obviously the difficulty is drawing the line at the point where there is enough information available on which choices can be based before key elements have been determined. Although incremental changes can be made at any point in the design and construction process, change orders can be expensive. Changing a glazing spec at the working drawing stage is relatively inexpensive (although HVAC sizing will be affected), but changing glazing size can be very costly.

Ideally, on major projects designers and energy consultants need to form partnerships that start at the very beginning of the project and continue through construction, as design intent is often lost during subsequent design, construction and operation. The reality is that design budgets, more often than not, allow for only brief encounters between energy consultants and the design team, and it is not always clear at what stage the partnership is most useful. Too often a strong energy design is compromised by decisions made later in the process after the energy consultant has left the team.

Myth #9. Better energy design tools lead to better designs. The use of energy simulation tools in the design phase allows for multiple permutations and variations to be explored as to how different strategies affect energy use. In our experience, however, architects don't want to use them, preferring to hire consultants for this purpose. So instead of putting the design tool in the hands of the designer, we see another member added to the design team. There is another concern here that when design tools become easy to use, any "tool user" can become an expert without necessarily understanding the consequences of his or her actions. The possibility for disasters is very real. We need to understand that tools are tools, and that they are still limited by the understanding of the user.

Myths told by energy professionals to consumers and each other.

The class of "energy professionals" encompasses so many distinct disciplines that it is difficult to find a common theme for our examples. Myths in this category are often the result of differences in disciplinary methods of thinking; thus economists and engineers may not be speaking the same language or sharing the same mental models. Wilk argues that because of the complex nature of human behavior, we need a "multigenic" or multi-disciplinary approach to address these issues (Wilk 1999). Such an approach would require the team to learn to communicate effectively with each other and reveal the implicit myths that guide their behavior.

Myth #10. Better environmental quality means greater productivity. The buzzword for the nineties has been "productivity" not "energy efficiency," for the obvious reason that U.S. office workers are expensive and energy is cheap. Several books and articles have been written on how better environmental design has enhanced productivity (Romm, Browning 1994). But it is difficult to measure the impact of changes in environmental design, and measuring productivity has always been extremely complex. To show causation between the two is not trivial. There are a few good studies that show the impact of environmental factors on health and productivity, but much of the literature is filled with questionable claims.

A classic example of the difficulty in evaluating productivity is the Lockheed Building. The author of the study writes that the daylighting was part of a larger plan to boost worker productivity," and notes that "Lockheed itself never published the figures concerning the improvements in absenteeism and productivity." And the author then goes on to report "But according to Don Aitken, then chairman of the Department of Environmental Studies at San Jose State, 'Lockheed moved a known population of workers into the building and absenteeism dropped 15%.' Aitken led numerous tours of Building 157 after it opened and was told by Lockheed officials that the reduced absenteeism 'paid 100% of the extra cost of the building in the first year.' The architect, Lee Windheim, also reports that Lockheed officials told him that productivity rose 15% for the first major contract done in the building compared to previous contracts done by those Lockheed engineers. Aitken reports an even more astonishing anecdote: Top Lockheed officials told him that they believe they won a very competitive $1.5 billion defense contract on the basis of their improved productivity—and that the profits from that contract paid for the entire building."

So the reported improvements in productivity are cited by the very people who believe in the importance of showing how efficiency improves productivity—the architect and the local energy champion. We are not suggesting that there were no increases in productivity at the Lockheed Building, but rather that the message is being conveyed by

those who want to believe that it is true. This may be a classic example of the myth taking precedence over the scientific evidence, particularly as the very individuals who have the scientific credentials to refute the myth, believe in its premise.

Myth #11. People behave rationally. We all behave, or have observed other people who exhibit behavior, in ways that may not be considered "rational". As one example we surveyed people who run their air conditioning at home in the summer with all the windows open. When questioned, they say they want to have both air conditioning and natural ventilation. From a building science perspective this makes little sense, because you can't cool the outdoors. But from the individual's perspective, they may want to be able to hear their kids playing outside while they are indoors sitting next to the blast from the air conditioner. Most people do behave rationally—according to their own definition of what's rational. However, the idea that people behave rationally according to their own definition of rationality and thus "people behave rationally" becomes a tautology. A concept we want to highlight is that the mental models of energy professionals often do not match the data well, and may take the place of, or precedence over, the existing data (see also Shove 1997). The apparent mismatch of consumer action with respect to economic models has promoted a substantial literature in energy policy centering on a perceived problem of under-investment in energy efficiency, and articulation of the "market barriers" that hold back this investment (see Shove 1998, Weber 1997). On the other hand, there is anecdotal evidence that many consumers are quite willing to invest in particular energy efficiency measures even if the cost-effectiveness calculations would show these measures to be bad investments relative to alternatives. By insisting on cost-effectiveness as a sales point, one may turn the focus to a very particular measure of what is good about energy efficiency, even talking people out of investment in energy efficiency they would otherwise want to undertake. In understanding energy consumption processes in the real world and trying to guide practices, energy analysts often need to observe rather than to assume.

Myth #12. "Sustainability" is the new way to sell energy efficiency. The term "sustainable" in reference to the environment has been in use since the 1970s, but was popularized in 1987 by the Bruntland Report, "Our Common Future", issued by the World Commission on Environment and Development. The report defines "sustainable development" as "…development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (Pantin 2000). "Sustainability" is thus another word that is often used in its mythic sense, one suggesting environmental stewardship. The term has been given prominence throughout architectural schools and design firms by articulate speakers and practitioners, but it is not clear that much besides labeling has changed as a result. Whatever the motivation for sustainability, whether or not it has been achieved is extremely hard to judge. A recently showcased green corporate headquarters was dismissed by local real estate brokers as "an attempt to appeal to young, environmentally conscious workers, and then pay them lower wages to work in their eco-friendly environment."

Because sustainability (somewhat like efficiency) can be attained and defined only in a relative sense but gives some appearance of being objective, it is susceptible to misuse. As O'Riordan (1988) suggests, sustainability is "... a mediating term designed to bridge the gulf between 'developers' and 'environmentalists.' Its beguiling simplicity and apparent self-evident meaning have obscured its inherent ambiguity." Though "sustainability" comprises a

hopefulness and attention that is often sincere, it is so unhinged from measurability that it can be used for a wide range of purposes without sufficient specificity or articulation. It is thus a myth within a myth, the word sustainable being a utopian ideal that can rarely be realized in any absolute sense in the contexts of modern technology in which it is used. Ironically, the often repeated testament on sustainability, attributed to Chief Seattle, appears to be the work of more recent authors (Stekel 1996), one example of how environmental values became increasingly, and strategically, identified with Native Americans over the century (see Gill 1987).

Myth #13. Installing energy retrofits or designing energy-efficient measures reduces energy use. It is all too easy to assume that installing (or even specifying) energy retrofits will lead to energy savings. In practice, unless they are the right measures, installed carefully and operated correctly, there won't be any energy savings. We've seen solar collectors on the north side of the roof (the owner wanted them visible from the street). We've come across numerous daylight and occupancy sensors that were taped over or disabled by workers who didn't like them or understand their purpose. And we've seen numerous controls on HVAC systems disabled by the building managers, either because they were never commissioned to work properly, or because the operators wanted to be in control. With careful planning and commitment the energy efficient strategies can work, but we can't take for granted that they will work automatically. The difference between what is easy to recommend and what is likely to be installed and operated correctly cannot be ignored.

Another example of an award-winning building that had less than expected energy savings following a major retrofit is the Federal Building in San Francisco. The project was featured in an editorial in ASHRAE Journal, which cites the project manager's claim of an annual savings from the new EMCS system of $500,000 (ASHRAE 1998). The researchers studying the performance of the building estimated the savings at closer to $43,000 (Diamond 1999). In this case, as in the Lockheed Building discussed earlier, the predicted savings became more important than the actual savings—intention becomes the reality. It was important for a large group of players (the designers, adopters, risk-takers) that the new technology be shown to be a success. The lack of savings is perhaps less critical than the demonstration to a profoundly skeptical and conservative community that the technology actually worked. This example points out how energy experts "can only 'see' through methodological spectacles of their own making," (Shove 1997) in which case claims can constitute a defining truth.

Myth #14. Energy efficiency measures result in using less energy. Sometimes the installation of an energy efficiency strategy results in increases in the amount of service, but not energy savings. One way to think of this is the difference between "energy conservation" and "energy efficiency" (Moezzi 1998). Many would argue that what we care about is efficiency: reducing waste by getting the most "bang for the buck." Others would see the need to reduce consumption of resources and reducing carbon emissions. An example is the consumer who buys 50% less-fat potato chips—and then eats twice as many (Huber 1998). The chips are more efficient (less fat used per chip) and the customer benefits by getting twice as much pleasure (arguably—the low-fat chips do taste worse)—but no calories have been saved. Focusing too much on energy efficiency as opposed to energy consumption can lead to the reduction in consumption itself being overlooked, even while reduced consumption is central for pollution control, creating the myth that: "you can do whatever

you want, as long as you do it efficiently," will lead to reduced consumption. This may occur even to the extent that higher consumption is rewarded because of the way that efficiency is defined (Moezzi 1998).

Conclusions: What Can We Learn From These Myths?

Myths about energy, like most myths, are not randomly generated and transmitted. Instead they are products of a particular structure of actors and motivations within the energy profession, and of mental models that are deeply ingrained in our minds and tools, making myths prone to persist even in the face of strong evidence to the contrary. Myths persist because people believe in them. Different groups tell different myths, and these different myths exist simultaneously, creating barriers to understanding between consumers, designers, and other energy professionals. Many of these myths are generalizations that are not easy to disprove. Providing knowledge alone is not sufficient to counter a myth; instead, we may have to reveal the underlying reasons for the need for the myth.

The implications for policy are twofold. In one case, policymakers may be perpetuating myths about energy by merely passing them along. Ideas about the impossibility of having operable windows in new commercial buildings, or the expected behavior of energy users, can be perpetuated because no one stops to verify whether these myths are actually true. In the second case, policymakers and researchers themselves become blind to their own myth-making by failing to take note of the assumptions in their own work. It is in this regard that we like to reinforce the idea that we always need to question assumptions, and to realize that different groups may interpret the same incomplete data in different ways. Questioning assumptions often requires collecting more data, probing commonly held beliefs and showing a willingness to set aside our pre-conceptions. Of course, much information must still be assumed. However, it is incumbent on us as scientists and researchers, to acknowledge carefully and explicitly our assumptions rather than to internalize them, and thus perpetuate them as myths.

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